

ABSTRACT OF THE DISCLOSURE

A positive displacement piston unit is provided that utilizes a magnetorheological (MR) or electrorheological (ER) fluid as the transmission fluid. Each cylinder of the invention has an intake port connected to the suction port of the hydrostatic pump and an output port connected to the pressure port. Flow of the transmission fluid through the cylinder is controlled by an electromagnet or electrode located in close proximity to the intake and output ports of the cylinder. By energizing the electromagnet or electrode, the viscosity of the transmission fluid can be increased such that the portion of the fluid immediately near the electromagnet or electrode substantially solidifies. The solidified portion of the transmission fluid disables fluid through the particular passage, thereby restricting flow of the transmission fluid to the cylinder. As such, the present invention does not require the use of mechanical cylinder valves to control the flow of the transmission fluid.

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